

## **OIL ANALYSIS REPORT**

Sample Rating Trend **WEAR** (QB18769) S0916A-Suamico

# 812060

Component **Front Center Diesel Engine** Fluid

PETRO CANADA DURON SHP 15W40 (42 QTS)

	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
	Sample Number		Client Info		GFL0095963	GFL0074838	GFL0074822
	Sample Date		Client Info		19 Dec 2023	10 Jul 2023	31 May 2023
	Machine Age	hrs	Client Info		2162	1540	1324
to	Oil Age	hrs	Client Info		622	216	607
	Oil Changed		Client Info		Changed	Changed	Changed
	Sample Status				ABNORMAL	NORMAL	ABNORMAL
	CONTAMINAT	ION	method	limit/base	current	history1	history2
	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
	Water		WC Method		NEG	NEG	NEG
	Glycol		WC Method	20.2	NEG	NEG	NEG
	-	0		live it /le e e e			-
	WEAR METAL		method	limit/base		history1	history2
	Iron	ppm	ASTM D5185m	>120	28	9	37
	Chromium	ppm	ASTM D5185m	>20	1	<1	2
	Nickel	ppm	ASTM D5185m	>5	<u> </u>	4	<b>A</b> 23
	Titanium	ppm	ASTM D5185m	>2	0	0	0
	Silver	ppm	ASTM D5185m	>2	<1	1	<1
	Aluminum	ppm	ASTM D5185m	>20	1	<1	<1
	Lead	ppm	ASTM D5185m	>40	0	0	1
	Copper	ppm	ASTM D5185m	>330	5	8	48
	Tin	ppm	ASTM D5185m	>15	<1	<1	1
	Vanadium	ppm	ASTM D5185m		0	0	0
	Cadmium	ppm	ASTM D5185m		0	<1	0
	ADDITIVES		line adde a al	limit/base	current	history1	history2
	<b>NBBIIIVEO</b>		method	in the base	current	Thotory	
	Boron	ppm	ASTM D5185m	0	4	5	10
		ppm ppm		0			10 0
	Boron		ASTM D5185m	0	4	5 0 53	10 0 65
	Boron Barium	ppm	ASTM D5185m ASTM D5185m	0 0 60	4 0	5 0 53 <1	10 0
	Boron Barium Molybdenum Manganese Magnesium	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	4 0 61	5 0 53	10 0 65
	Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	4 0 61 <1	5 0 53 <1	10 0 65 2
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	4 0 61 <1 965 1137 1048	5 0 53 <1 914 1102 963	10 0 65 2 1001 1198 987
	Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	4 0 61 <1 965 1137	5 0 53 <1 914 1102	10 0 65 2 1001 1198
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	4 0 61 <1 965 1137 1048	5 0 53 <1 914 1102 963	10 0 65 2 1001 1198 987
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270	4 0 61 <1 965 1137 1048 1281 2618	5 0 53 <1 914 1102 963 1232	10 0 65 2 1001 1198 987 1309
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	4 0 61 <1 965 1137 1048 1281 2618	5 0 53 <1 914 1102 963 1232 3479	10 0 65 2 1001 1198 987 1309 3203
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	4 0 61 <1 965 1137 1048 1281 2618 current	5 0 53 <1 914 1102 963 1232 3479 history1	10 0 65 2 1001 1198 987 1309 3203 history2
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b>	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base	4 0 61 <1 965 1137 1048 1281 2618 current 4	5 0 53 <1 914 1102 963 1232 3479 history1 3	10 0 65 2 1001 1198 987 1309 3203 history2 6
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base	4 0 61 <1 965 1137 1048 1281 2618 current 4 3 <1	5 0 53 <1 914 1102 963 1232 3479 history1 3 2	10 0 65 2 1001 1198 987 1309 3203 history2 6 4
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20	4 0 61 <1 965 1137 1048 1281 2618 current 4 3 <1	5 0 53 <1 914 1102 963 1232 3479 history1 3 2 2 2	10 0 65 2 1001 1198 987 1309 3203 history2 6 4 3
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b>	ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base >25	4 0 61 <1 965 1137 1048 1281 2618 current 4 3 <1 current 0.8	5 0 53 <1 914 1102 963 1232 3479 history1 3 2 2 2 history1 0.6	10 0 65 2 1001 1198 987 1309 3203 history2 6 4 3 3 history2 1.2
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b> ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 20 limit/base >20	4 0 61 <1 965 1137 1048 1281 2618 current 4 3 <1 current	5 0 53 <1 914 1102 963 1232 3479 history1 3 2 2 2 history1	10 0 65 2 1001 1198 987 1309 3203 history2 6 4 3 3
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 20 limit/base >20	4 0 61 <1 965 1137 1048 1281 2618 current 4 3 <1 current 0.8 7.5 21.2	5 0 53 <1 914 1102 963 1232 3479 history1 3 2 2 2 history1 0.6 6.8	10 0 65 2 1001 1198 987 1309 3203 history2 6 4 3 3 history2 1.2 9.9
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 limit/base >25 20 limit/base >4 >20 >30	4 0 61 <1 965 1137 1048 1281 2618 <i>current</i> 4 3 <1 <i>current</i> 0.8 7.5 21.2 <i>current</i>	5 0 53 <1 914 1102 963 1232 3479 history1 3 2 2 2 history1 0.6 6.8 19.7 history1	10 0 65 2 1001 1198 987 1309 3203 history2 6 4 3 history2 1.2 9.9 22.1 history2
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 20 1000 20 20 20 20 20 20 20 20 20 20 20 20	4 0 61 <1 965 1137 1048 1281 2618 current 4 3 <1 current 0.8 7.5 21.2	5 0 53 <1 914 1102 963 1232 3479 history1 3 2 2 2 history1 0.6 6.8 19.7	10 0 65 2 1001 1198 987 1309 3203 history2 6 4 3 3 history2 1.2 9.9 22.1

## DIAGNOSIS Recommendation

Oil and filter change at the time of sampling has been noted. No corrective action is recommende at this time. Resample at the next service interva monitor.

### 🔺 Wear

Valve wear is indicated. All other component weat rates are normal.

#### Contamination

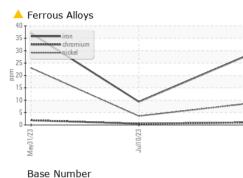
There is no indication of any contamination in the oil.

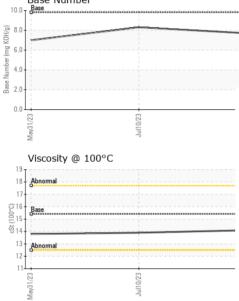
#### Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.



# **OIL ANALYSIS REPORT**





			VISUAL		method	limit/base	current	history1	history2
			Vhite Metal	scalar	*Visual	NONE	NONE	NONE	NONE
	/	Y	ellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
		Р	recipitate	scalar	*Visual	NONE	NONE	NONE	NONE
		S	ilt	scalar	*Visual	NONE	NONE	NONE	NONE
	and a day of the line of the day of the Way Street and state	D	ebris	scalar	*Visual	NONE	NONE	NONE	NONE
	*********************************		and/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Jul10/23	Dec19/23	Α	ppearance	scalar	*Visual	NORML	NORML	NORML	NORML
Jul	Deci	0	dor	scalar	*Visual	NORML	NORML	NORML	NORML
		E	mulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		F	ree Water	scalar	*Visual		NEG	NEG	NEG
			FLUID PROPE	ERTIES	method	limit/base	current	history1	history2
		V	′isc @ 100°C	cSt	ASTM D445	15.4	14.1	13.9	13.8
			GRAPHS						
		40 T	Ferrous Alloys						
23		35	iron						
Jul10/23		30-	nickel						
7		25 -				/			
		튭 20							
		15-							
		10-		$\searrow$					
		5 -			and the Real Property Street of Stre	1419 - 1949			
		0							
			1/23	Jul10/23 -		9/23 .			
			May31/23	Jult		Dec19/23			
			Non-ferrous Meta	als					
Jul10/23		<sup>50</sup> T	*						
Jult		40	copper						
		40 -	tin						
		30-							
		bpm							
		20							
		10-							
		10		-					
		0	~	~					
			ay31/23	Jul10/23		ec19/23			
			Σ			Dec			
		19-	Viscosity @ 100°	С			Base Number		
			AL			10.0	Base		
		18-	Abnormal						
		17-				(B/HO			
		0 <sup>16</sup>	Base			<u>P</u> 6.0			
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		13-	Abnormal			<sup>88</sup> 2.0			
		12-				1			
		11	<u></u>	22					
			May31/23	Jul10/23		Dec19/23	May31/23	Jul10/23	
			Ma	Ju		De	Ma	٦Ľ	
	Laboratory		VearCheck USA -	501 Madi	son Ave Ca	rv NC 2751		vironmental - 0	164 - Suami
	Laboratory Sample No.	: V	VearCheck USA - GFL0095963				3 GFL En	vironmental - 9 2300	
<b>LAB</b>	Laboratory Sample No. Lab Number	: V : C	WearCheck USA - GFL0095963 )6044428	501 Madi Recieved Diagnos	<b>d</b> : 26 l	ry, NC 27513 Dec 2023 Dec 2023	3 GFL En		Deerfield Ave
	Sample No. Lab Number Unique Number	: V : C : 0 : 1	GFL0095963	Recieved	d : 26 l ed : 27 l	Dec 2023		2300	Deerfield Ave Suamico, V US 543
	Sample No. Lab Number Unique Number Test Package	: V : C : 0 : 1 : F	GFL0095963 06044428 0805036 FLEET	Recieveo Diagnos Diagnos	d : 26 I ed : 27 I tician : Dor	Dec 2023 Dec 2023 Baldridge		2300 Contact: NICHO	Deerfield Ave Suamico, V US 543 <sup>-</sup> LAS WEIDNE
iscuss this	Sample No. Lab Number Unique Number Test Package sample report,	: V : C : 0 : 1 : F <i>cont</i>	GFL0095963 0 <mark>6044428</mark> 0805036	Recieved Diagnos Diagnos vice at 1-8	d : 26   ed : 27   tician : Dor 200-237-1369	Dec 2023 Dec 2023 I Baldridge		2300 Contact: NICHO	Deerfield Ave Suamico, V US 543

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Submitted By: NICHOLAS WEIDNER

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